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Agricultural Libraries Information Notes



National
Agricultural
Library

U.S. Department
of Agriculture
Beltsville, MD
20705

Volume 16
Number 10

October 1990

ISSN: 0095-2699



photo: J. Swab

Pamela Andre (center), Associate Director for Automation, NAL, holds a copy of the "National CD-ROM Sampler: An Extension Reference Library" compact disc, while an image from the disc is seen on the monitor. This issue of ALIN updates several NAL CD-ROM projects [see April 1990 issue for full coverage of the "Extension Sampler."] Also in the above photo are Mary Miller, Extension Specialist, Virginia Cooperative Extension Service, VPI; Thomas Tate, Head of Extension Service Information and Educational Technology, USDA; and Bob Rubinyi, Extension Specialist, Minnesota Extension Service. These four were the project leaders for their organizations.

In the Field of Agriculture, CD-ROM Delivers!

by Pamela Q. J. Andre
Associate Director for Automation, NAL

Modern agriculture means many things to many people. The family farmer in Vermont raises chickens and goats on a part-time basis. Agribusinesses in the mid-west raise enough corn, wheat and soybeans to feed the entire country and have enough left over to sell abroad. Extension workers across the country assist rural, suburban and urban citizens with such agriculturally related tasks as providing the best nutrition to a growing family, protecting roses from aphid attack, or weaning a calf. These scenarios reflect what is best known about American agriculture. What is lesser known is the fact that United States Department of Agriculture research chemists in Louisiana discovered the process that led to the development of flame retardants for children's clothing; research botanists in Maryland are testing for ways to eradicate the coca plant; and research geneticists in California are emphasizing biotechnology and genetic engineering to develop better plant and animal

Also in this issue...

World List of Agricultural Serials, pp. 3-5
Ornamental Horticulture: A Multimedia CD-ROM, pp. 5-7
Optical Scanning and Text Recognition...(+ NATDP), pp. 7-11
Topics Series Enhancements; FAS Files on ALF, p. 11
Information Delivery to Rural America Conf. Rept., pp. 12-14
Rural Information Center's Online Monitoring System, pp. 14-15
Indexing of Core Veterinary Journals, pp. 15-16
Indexing Seminar Report, pp. 16-17
Announcements, pp. 17, 22-23
Staff Update, pp. 18-19, 24; New Bibliographies, pp. 19-20
New Serials, pp. 20-21; Agriculture Datebook, pp. 21-22
...and more

products. Agriculture today is the food we eat, the clothing we wear, the homes we live in and the problems we seek to solve to ensure this bounty for future generations.

What is not at all clear in the litany above is the role of CD-ROM technology as related to information dissemination that is very closely tied to modern agriculture. Information is important to the family farmer and the agribusiness conglomerate. Prices, weather and even the world political situation are topics where current information can be of critical importance in deciding what animals to raise and what crops to plant. For the U.S. Extension Service, information is truly life blood. "Over 16,000 extension workers at over 3,000 locations in the U.S. provide technical information to U.S. citizens millions of times a year," according to Myron Johnsrud, Administrator of the Extension Service. Information is also a key tool in agricultural research. An understanding of both current and past research activities is an important part of the process which enables researchers to make decisions on current research directions based on the successes and failures of earlier efforts. A major concern is how to get the information needed by this varied community where it is needed, when it is needed. That is the role of CD-ROM!

In the search for agricultural information, more than two dozen CD-ROM products are available. Over three million bibliographic records are stored on CD-ROMs from the National Agricultural Library, CAB International, and the Food and Agriculture Organization of the United Nations. CD-ROMs are also available with information on aquaculture, agricultural statistics, and pesticides to name just a few topics. Numerous CD-ROM products are available from the Cooperative State Extension Service. The "National CD-ROM Sampler" is effectively an extension reference library with over 50,000 pages of material including 1,500 graphics, and over 50 computer programs on one compact disc. [See the lead articles in *ALIN*, 16(4):1-5, April 1990, for information on the "National CD-ROM Sampler: An Extension Reference Library."]

CD-ROM products of the National Agricultural Text Digitizing Project (NATDP) at the National Agricultural Library include both text and page image information on topics as varied as aquaculture, acid rain, and agent orange. NAL has a continuing program with plans for future CD-ROM products on food irradiation and the *Journal of the American Association of Agronomy*. [See article in this issue of *ALIN* for update on the NATDP.]

Many international agricultural centers are also developing CD-ROM products. The Royal Tropical Institute in Amsterdam has developed a CD-ROM containing abstracts of material on tropical agriculture, while the International Center for Maize Research in Mexico has created a CD-ROM containing maize germplasm data, and the Centre d'Information et de Documentation en Agronomie de Regions Chaudes (CIDARC) in France has created a CD-

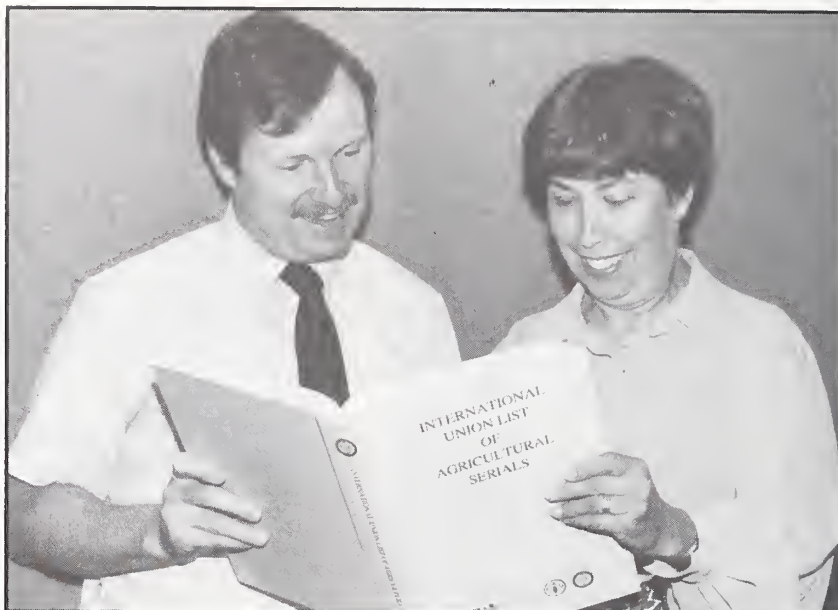


photo: J. Swab
David Goldberg, Cataloger and Project Manager for the **International Union List of Agricultural Serials**, and Rose Broome, Systems Analyst and technical manager of the project software and database, look at the first copy of the publication received at NAL.

ROM on agricultural research and rural development literature by French scientists. Perhaps the most significant international CD-ROM project is that undertaken by the Secretariat of the Consultative Group on International Agricultural Research (CGIAR). This project will provide the entire retrospective set of research reports from the 13 CGIAR research centers, a total of more than 450,000 pages, on a set of 27 CD-ROM discs by the end of 1991. Also coming will be a series of CD-ROMs containing a core list of agricultural literature selected by a group of international specialists under the direction of Cornell University's Mann Library. [See *ALIN*, 15(8):1-2, 11-14, August 1989, for discussion of the Cornell project, and *ALIN*, 16(4):10-11, April 1990, for update.]

One can foresee a time when anyone can access the world's agricultural information from a work station located in home, office, barn, or even the cab of a tractor. Information on nutrition, pesticide use, corn and wheat yields, or the latest research data on plant genetics or hog breeding will be available.

Therefore, what is CD-ROM to the world of agriculture? It is access to millions of bibliographic records and thousands of pages of text. It is access to research results, mathematical models, and statistical data. In summary, it is a distribution medium *par excellence*. CD-ROM has a huge storage capacity, total flexibility regarding data type—as long as it's digital—, compact size for easy and inexpensive shipping and handling and, thanks to the foresight of the High Sierra Group, it is a standard product that can be played on any CD-ROM player anywhere in the world where electricity is available. CD-ROM is on the way to being something for everybody in the world agricultural community.

[A slightly different version of this article appeared in *CD-ROM EndUser*, 2(3):26-27, July 1990, published by Helgeson Associates, Inc., 1-800-688-3374.]

World List of Agricultural Serials

by Sarah E. Thomas

Associate Director for Technical Services, NAL

In 1985, Joseph Howard, Director of the National Agricultural Library, put forth an idea that has grown into the *World List of Agricultural Serials*. Howard's concept was a comprehensive list of agricultural serials annotated with an indication of whether or not a title was indexed in one of the three major agricultural databases: AGRICOLA, AGRIS, or CAB ABSTRACTS. Once completed, the *World List* would serve as a verification source for document delivery, a reference aid for selection, and as a tool for eliminating unnecessary duplication in indexing coverage.

A Collaborative Effort

The *World List* is a collaborative effort of the National Agricultural Library and CAB International—CABI. The Food and Agriculture Organization of the United Nations—FAO—cooperated through the contribution of a list of titles indexed in AGRIS. Creation of the file originally appeared to be a simple task of comparing three lists of serial titles, but ultimately turned out to be far more complex and challenging. NAL agreed to prepare a machine-readable file of relevant bibliographic citations and to produce from the file a magnetic tape that could be used by CABI to produce camera-ready copy for publication.

Several sources of data were identified. NAL had a master file of approximately 45,000 MARC serial records generated over 18 years of online cataloging. CABI had a list of 10,000 journals scanned for CAB ABSTRACTS. AGRIS could pull almost 3000 titles from its bibliographic database. Initially, the most efficient approach appeared to be to match the three lists automatically using an algorithm that would be developed by NAL's Information Systems Branch. An early estimate of costs put the method of machine-matching beyond the resources of the cooperators, and plans quickly shifted to a mix of manual and automated means.

NAL proposed to use its serials master file as a basis against which the two smaller lists would be manually compared. For ease in manipulating the file, NAL decided to use its Alpha Micro system, into which it loaded records for 45,000 titles. Procedures were developed that called for CABI titles to be searched against the list, and if found, the note "Indexed in CAB ABSTRACTS" was to be added. A similar procedure would be followed for AGRIS. Unique titles would be keyed in from the relevant list. Estimates prepared for management in 1986 allocated .65 FTE staff to serve as project manager and editor, .5 FTE support staff for searching and keying, and .4 FTE for programming.

Problems

Like many automation projects, these figures turned out to be woefully inadequate. Because of delays in obtaining



photo: J. Swab

Shirley Paull looks over the shoulder of Gloria Pugh as together they solve a data input problem on the *World List of Agricultural Serials*. They are two of a dozen cataloging staff who worked on this project.

the appropriate software for loading the MARC records into the Alpha Micro, the editor decided to search CAB records in OCLC first. If no NAL record were found, it was assumed that NAL did not hold the title, since virtually all NAL serials were presumed to be in OCLC. Searchers noted the OCLC number of the unique item for future downloading.

As the editor delved deeper into the project, several unforeseen idiosyncracies emerged. All NAL serial titles were not cataloged on OCLC. Serials had been cataloged using different editions of the cataloging code, and thus were not always located consistently. Some items were cataloged under rules specifying "latest entry," and others under "successive entry." Many records lacked ISSN's, and there was insufficient bibliographic information provided to determine accurately if two titles were identical. NAL's large list of serials had not been updated to reflect current indexing policy, so roughly 2500 titles included in NAL's *List of Journals Indexed in AGRICOLA* had to be searched in the file. Several data elements that had been considered mandatory were found to be missing or incorrect. For example, at one period in its cataloging history, NAL had coded some foreign language titles as "English" and had omitted the vernacular title, including only an English translation in the record.

Because NAL records contained Library of Congress

subject headings and others did not, NAL and CABI decided to apply the AGRICOLA category codes for subject access. NAL assigned one or more subject codes for every AGRIS or CABI title not held by NAL, and in addition, had to apply codes for many NAL titles cataloged prior to 1980. It was discovered that duplicate Chinese titles were not being identified because NAL had cataloged its serials using the Wade-Giles transliteration scheme following the standard established by the Library of Congress and CABI and AGRIS titles employed Pinyin. Earlier iterations of NAL's automated system had not accommodated the full ALA character set, so certain diacritics were wrong or stripped from the machine-readable record.

And More Problems

There were other vexing considerations. Was the *World List* to contain only currently published titles, or were serials that had ceased publication also to be included? Once the editor had decided to include the so-called "dead" serials, he was faced with the question of whether or not to link them to other titles. Since serials have a distressing history of merging, splitting, changing title, and generally being difficult genealogically and bibliographically to trace, the editor was concerned about the reliability of their data, and the project managers worried about the expense of tracking and relating the vast numbers of titles. The principle of "something is better than nothing" squared off against quality control.

Once the editor and project managers had grappled with the issues of country codes and diacritics, they still had a major decision facing them. What was the scope of the database to be? Agriculture can be quite broadly defined, and the file contained references to titles in chemistry, geology, medicine as well as to more traditional subjects such as botany and zoology. Since it was based on NAL's catalog master file, it also held citations to titles in library science, information technology, and management. Eventually, the editor excluded obviously non-agricultural materials, but kept most others.

Originally, NAL and CABI had planned to publish the entire list in printed form, but as NAL began to produce samples of camera-ready copy in an array of point sizes, it became apparent that the full file would spill over into a multivolume set. Given the concerns about the quality of some of the data, the unanticipated expense of producing the printed volumes tipped the scales to a revised short term goal. The editor would concentrate on only those titles indexed in AGRICOLA, AGRIS, or CAB ABSTRACTS, and corrections on the remaining 40,000 records would be deferred. As a result, CABI was able to publish the single volume *International Union List of Agricultural Serials—IULAS* in early 1990.

Updating the World List

Since IULAS was issued, NAL has refocused its attention on the complete file. Recognizing its potential as a CD-ROM product, NAL has begun to upgrade the data and investigate how it might best disseminate the file. To develop the *World List* into as useful a tool as possible, NAL



photo: J. Swab

David Goldberg and Rose Broome are interrupted while solving a problem related to formatting of the *World List of Agricultural Serials* on NAL's Alpha-Micro computer. The first product of the project, the *International Union List of Agricultural Serials*, was published in book form by CAB International for the National Agricultural Library, the Commission of the European Communities, the Food and Agriculture Organization of the United Nations, and CAB International. While the book contains listings of agricultural serials indexed in databases supported by these organizations, eventually the entire *World List* will be published on CD-ROM.

is requesting that agricultural organizations around the world contribute the national agricultural serial lists. Bibliographies from the People's Republic of China, the Federal Republic of Germany, the Caribbean region, and elsewhere have already been received. Certain subject areas have been covered in greater depth as a result of external funding provided for this purpose. Two printed products, the *World List of Poultry Serials* and the *World List of Aquaculture and Marine Science Serials* are subsets of the file that have received special attention. Another, as yet inchoate plan, is to add holdings information to the bibliographic record.

Future Plans

Recent estimates indicate that NAL must invest over 4350 hours of labor to prepare records in the *World List* for output on compact disc. Although the project has all the elements of a manager's bibliographic nightmare, its ultimate value has persuaded the collaborators to continue their efforts. NAL has utilized the file internally to analyze overlap among AGRICOLA, AGRIS, and CAB ABSTRACTS; to prepare a list of Soviet titles held by the library; to determine how many serials on the subject of potatoes it contained; and to identify key agricultural titles not held by NAL for possible



photo: D. Starr

Elizabeth Whiting, a librarian formerly with NAL, and David Goldberg were the principal editors of the *World List* during the phases of the project completed so far, and of the published *International Union List of Agricultural Serials*.

acquisition. When the file is available as a CD-ROM, the entire agricultural community will be able to derive similar benefits. Within the next year, a CD-ROM version of the *World List of Agricultural Serials* should become a reality.

[A slightly different and abbreviated version of this article appeared in *CD-ROM EndUser*, 2(3):44-45, July 1990, published by Helgeson Associates, Inc., 1-800-688-3374.]

Ornamental Horticulture: A Multimedia CD-ROM

by Pamela R. Mason
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Information Systems Division, NAL

The National Agricultural Library is planning to produce a multimedia CD-ROM on plants used in ornamental horticulture. These are plants used for landscaping rather than as food crops or for other specialized uses. This research project will be carried out in cooperation with the University of Florida Institute for Food and Agricultural Sciences and Michigan State University Cooperative Extension Service. This article covers a few of the issues involved and options explored in the course of the planning process.

Disc Overview

An obvious first step in the project was choosing a subject whose presentation could be genuinely enhanced by multimedia. The rule that CD-ROMs should not merely mount a database in a different format but provide a "value-added" service also guided subject selection. (See figure 1: Multimedia CD-ROM "Ornamental Horticulture.")

In Phase I, the three cooperating institutions will produce a full-featured prototype of the CD-ROM, using a database concerning some 800-1000 plants grown in all climate zones

of the United States. The ornamental horticulture database, which is to be developed by the project, will be enhanced by the addition of images of the complete plant, portions of the plant selected for highlighting, descriptive texts, garden designs, etc. Hypermedia links will connect general cultural advice with information appropriate to regional requirements, bibliographic citations, texts of pertinent documents, illustrations, and related fields in the database. These links will provide a much better resource than the mere sum of the parts. Another enhancement, an expert system "front end" will guide both novice and enthusiast through the thicket of information. As a finishing touch, audio portions of the disc will provide the "correct pronunciation" of plant names (in "taxonomic" Latin, English and Spanish) as well as aid in explaining operation of the disc and the hypermedia approach to information retrieval. (See the Sample Search in the box on page 6.)

Phase II will expand the database and accompanying material to cover additional plants. Phase III will add more audio enhancements to the disc and adapt the software and images to the Macintosh environment.

Software Selection

The field of multimedia authoring tools for the IBM PC and clones is growing. Numerous text-oriented programs allow retrieval of image files and, in theory, audio files as well. However, most multimedia authoring programs are designed for audiovisual presentations or are geared to a specific technology, such as CD-ROM-XA (Extended Architecture) or DVI (Digital Video Interactive). For a developer attempting to work with an existing installed base of hardware, enhanced as economically as possible, this represents a problem. Furthermore, the ornamental horticulture disc will contain a significant amount of textual material as well as a database and expert systems. Software which allows hypertext linking may suffice, but it is unclear at this point if multimedia authoring software for the IBM PC platform has sufficient functionality for this project.

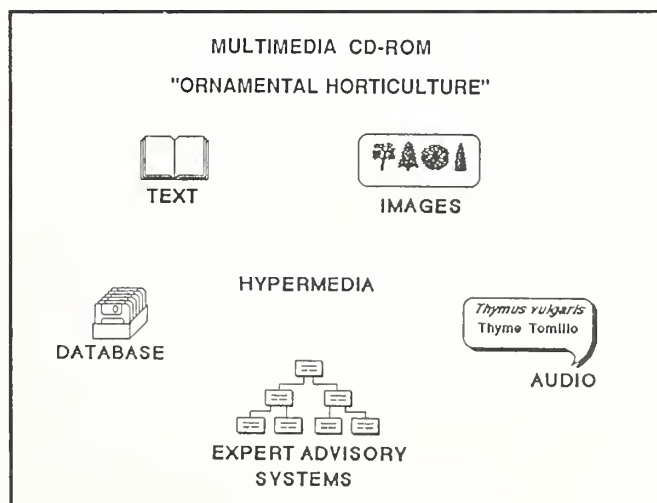


Figure 1.

Expert Advisory System

Through development of an expert system “front end” the project intends to create a user interface which allows access to information depending on level of gardening expertise (and not on searching ability). NAL has already developed expert systems using off-the-shelf software. A recent project on African aquaculture (REGIS) uses “KnowledgePro” expert system software, modified to facilitate hypermedia links as well as text and database searching.

The ornamental horticulture multimedia CD-ROM project will build on NAL’s background of experience, either using a current version of the software used in previous projects or using the experience gained to select another package. The systems so far developed are *advisory* in nature. A user’s questions and responses to questions asked by the system are selected from a menu. Once the sequence of questions and responses is completed, a series of recommendations follow which have been “pre-weighted” in the course of developing the system. This accomplishes a kind of pre-screening, as well.

As described in the “sample search” (see box on this page), an expert system will direct the user to options appropriate for different levels of horticultural and general gardening knowledge. Within the disc program’s operation (database, text, images), expert advisory systems on plant identification, cultural conditions, disease identification and treatment, and landscaping/garden design will further guide the user.

The prototype disc of Phase I will contain an expert advisory system to provide beginning guidance (an introduction to hypermedia, contents of the disc, etc.) and to answer

some of the most important horticultural questions users are likely to pose. The expanded version of Phase II, will add the enhancements cited above.

Navigation

Concern over the problem of “losing one’s way” in the hypermedia web has led the project managers to look at useful ways, beyond those supplied by the software, of displaying information clearly and graphically. An interactive introduction to the disc will highlight potential paths to choose and samples from the database, images, and texts. This introductory section will orient the user, regardless of experience level, and will contain the most sustained use of audio. When the audio section is expanded during Phase III, the intent is to convert to a bilingual format in English and Spanish.

Images

Image file input, storage, and display represent a significant problem in the creation of a multimedia CD-ROM. File sizes can be huge. A typical 8 1/2" x 11" typewritten page, scanned and stored at 300 dpi (dots per inch) without compression occupies 1 megabyte of space. With compression, it can be reduced to about 100 kilobytes. ASCII text for the same page takes up only about 2 kilobytes. If the image is a photograph, scanned in gray scale, the uncompressed image file size can go up to 8 megabytes, depending on size of the photograph, scanning resolution, and the amount of “pixel depth” of the scanner. A color image for the same size original is three times larger—about 24 megabytes. Al-

Ornamental Horticulture: A Multimedia CD-ROM “Sample Search”

At a garden center, or at the local Cooperative Extension Service office, the would-be gardener could find information in several ways, all geared to his or her level of expertise. For example, someone in suburban Chicago wishing to grow azaleas could retrieve information in the following way:

The user enters his or her choice from the menu, “Plant Search,” which includes the choice of searching by the specific name of the plant or by a general plant group, such as shrubs or trees. At this point the expert advisory system would be an option for a novice gardener (the expert could key in the plant name in a blank field area). A series of questions would ensue, e.g.,

“For what plant do you need information?” The user would choose from several possible lists: Common Names (English), Common Names (Spanish), List of Scientific Names (Latin). The hypothetical user selects, “Azalea.” He or she could also have selected from other headings such as : Shrubs, Trees, Bulbs, Perennials, etc. The advisory system would proceed to locate the area in which the user wanted to grow the plant, note any special characteristics desired (such as “pink flowers in spring”), sort through the database appropriate to that climate zone, and then produce the resulting list, “These *azalea* cultivars

grow in Chicago (zone 5), have pink flowers in spring and are shade tolerant.” [A list would follow.] If the user entered so many criteria that the sort on the database was negative, the advisory system would help revise the search. The default response would be a simple list for the plant and climate zone, e.g., “No plants exactly match your request, but the following *azaleas* will grow in Chicago, (zone 5):

1. Azalea (Rhododendron) ‘Louise Gable’
2. Azalea (Rhododendron) ‘Purple Splendor’

etc. At this point the user could print the list and select a plant description by its number. The resulting screen would carry the complete description of the plant, beginning with its correct name. Icons or lists of options would let the user look at images of the plant, hear the correct pronunciations of the name, and retrieve general as well as zone-specific information on how to grow azaleas. Information on problem areas, pests and diseases would be highlighted. The user would have the option to print the horticultural advice, go on to some landscaping ideas, or possibly—if the disc were located in a nursery setting—show what plants from the list were available in the current stock by referring to a current list kept up to date on the hard drive.

A number of other options would also be available beyond those covered in this example from the Phase I prototype.

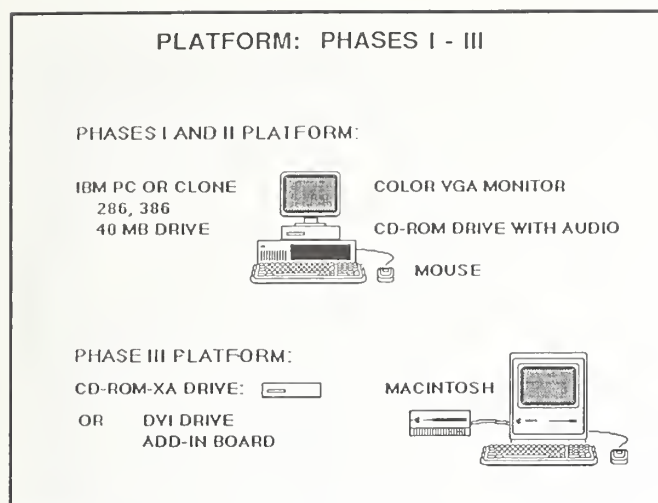


Figure 2.

though the CD-ROM capacity is huge—some 680 megabytes—it can clearly be filled up with image files rather quickly.

Compression of image files is therefore a necessity. For our project, the color image files will first be reduced in size by the simple expedient of digitizing 35mm color slides, not 8" x 10" photos. A single slide scanner will be used for all slide conversions to maintain consistently high quality images. The image format will be PCX, a standard, not a proprietary format. The estimated file size per slide, after compression, will be between 30-300 kilobytes, depending on VGA option.

Platform

Choice of platform has in large part been determined by gauging which computers are used at present to run the "installed base" of CD-ROM drives in libraries (particularly those in the land-grant universities with whom NAL most frequently cooperates) and by the type of CD-ROM drive which forms the majority of the "installed base." However, some degree of flexibility for future developments has also been included in the platforms chosen for Phases I-III. (See figure 2: Platform: Phases I-III.)

In Phases I and II the prototype and expanded CD-ROM disc will run on IBM PCs and clones. At this point, FM-level audio more than meets our basic requirements, but playback presents a problem. Conversely, CD-level audio can be accessed directly from the disc by any CD-ROM player which supports audio. Therefore, in Phases I and II full CD-level audio will be provided, allowing audio playback on any drive with earphone or speaker connections.

CD-level audio occupies a significant amount of disc space. By converting in Phase III to one of the CD-ROM XA (Extended Architecture) standards for audio (which, because of the lower sound requirements, does not occupy as many tracks as full CD-level audio) we can include much more audio on the same disc. Lower-level audio can be played on CD-ROM-XA drives or PCs equipped with add-in audio boards (by IBM, and more recently, an add-in XA board by a third party vendor). Drives which support DVI (Digital Video Interactive) will also play CD-ROM-XA

format discs. These drives and boards will be more readily available (and affordable) by late 1991, when Phase III of the project will take place. The Macintosh as it exists now supports the full range of audio levels. As already noted, in Phase III the disc will be revised to run on both the PC and Macintosh platforms.

The minimum *preferred* image display platform for Phases I and II will be on a color VGA monitor. Of the available display options, "Super" or "Expanded" VGA color graphics display, supporting a monitor with screen resolution of 640 x 480 pixels, displaying 256 colors at one time is the most desirable. Alternatively, a color VGA resolution of 320 x 200 pixels with 256 colors may present the subjects in sufficient detail for some users. Interestingly, in test images of plants, the higher resolution VGA with 640 x 480 pixels and only 16 colors appears to be a much less distinct image because of the limited range of colors. In Phase III, the disc's images will be converted to a format accessible by the Macintosh, so the disc could be viewed on either a PC or a Macintosh.

The multimedia CD-ROM project is complex, but the project manager estimates the Phase I and II can be completed in about 20 months' time by a project group of approximately five people working on a part-time basis. For Phase III, with its many conversions, there is as yet no timetable.

[A slightly different and abbreviated version of this article appeared in *CD-ROM EndUser*, 2(3):46-48, July 1990, published by Helgerson Associates, Inc., 1-800-688-3374.]

Optical Scanning and Text Recognition: Technology Evaluation

by Judith A. Zidar
NATDP Project Coordinator, NAL

In 1987, the National Agricultural Library and 41 land-grant university libraries entered into a cooperative effort known as the National Agricultural Text Digitizing Project (NATDP). The purpose of this project was to test optical scanning and text recognition technologies as a method of capturing printed materials in digital format for publication on CD-ROM. Since 1987, five more sites have joined the project, four databases have been distributed and evaluated, and a wealth of information has been gathered. Official reports on NATDP will be issued in late 1990. In the meantime, this article describes an optical technology effort in a library environment.

In the Beginning

The project staff should have known what they were getting into when the boss first said, "You'll probably have to wing it on this project." There were few precedents for this kind of work in a library setting, and terms like "pioneering" and "leading edge" were common, but the task didn't

TEXT DIGITIZING at the NATIONAL AGRICULTURAL LIBRARY

1. SCAN Source Documents

2. CONVERSION of Text Portion to ASCII Code

3. EDITING of Converted Text

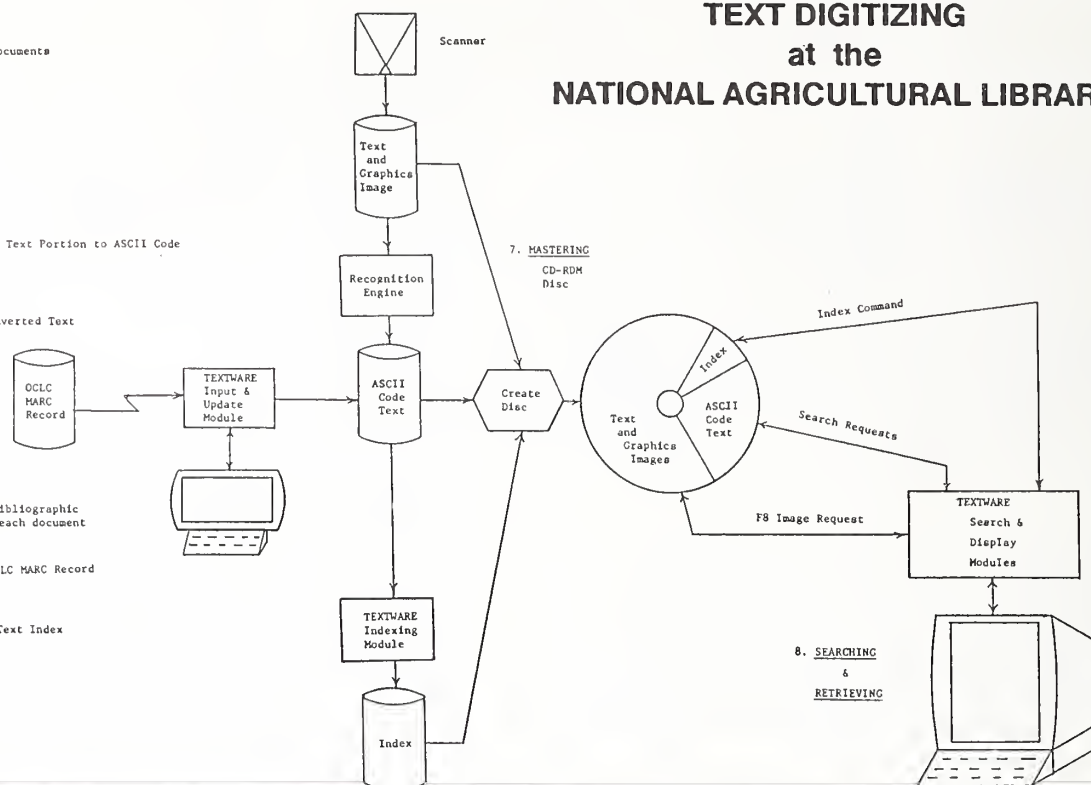
4. ADDITION
of short Bibliographic
record to each document

5. ADDITION of OCLC MARC Record

6. CREATE Full Text Index

7. MASTERING
CD-RDM
Disc

8. SEARCHING
&
RETRIEVING



seem that difficult. The project would optically scan the pages of selected publications to create page images, run those page images through an OCR (Optical Character Recognition) engine to produce ASCII text, use authoring software to index the text, and then use retrieval software to search the text and access the page images. The page images, full text, and indexing would be permanently stored on WORM (Write Once, Read Many) optical discs. These the project would master to an optical disc format which could be distributed, such as CD-ROM, and everyone who needed it would have immediate, local access to the information! It couldn't have been more simple. And it didn't bother project staff that no one else was doing it. This was, after all, "new technology."

Actually, banks had been using scanning and OCR technology since the 1950s to handle the millions of transactions they processed each year. What was new in the 1980s was the vastly superior "intelligence" and capabilities of these systems, combined with tumbling costs that put them within reach of the not-so-rich. The new systems could run on a microcomputer and use an optical drive for backup, which meant that a mainframe was no longer necessary. And this is what made the technology especially suited to libraries, where personal computers are the tool of choice.

NAL had been experimenting with full text plus graphics for over three years using the videodisc, but information capture was laborious and time-consuming. A better method was needed, and optical scanning appeared to be that method. More importantly, the project needed a delivery medium which was standardized and independent

of any one vendor. CD-ROM suited the needs perfectly.

The New Technology

With the enthusiastic support and financial backing of the land-grant universities and USDA, a scanning workstation was installed at NAL in January of 1988. Consisting of an NEC 286 PowerMate computer with 230MB hard disk and 640K RAM, a Ricoh optical scanner and laser printer, a Calera recognition server, a LaserView 150-dpi high-resolution monitor, and Maxtor 5 1/4-inch WORM drive, the system was integrated by Science Applications International Corporation (SAIC) who also supplied menu-driven processing software. A second workstation, minus the scanner, was installed to serve as a retrieval and testing system, and it was networked to the scanning station using DNA software. The project was finally ready to scan!

Operations

Test scanning began smoothly. The processing software was easy to use, and it tracked the materials through the various processing steps, from page scanning to text indexing. But it soon became clear that the tracking software occasionally "lost" a record, and manual tracking was instituted as a backup. Although frustrating at first, this proved to be a blessing. The log book that resulted has been an invaluable tool for tracking each page of scanning; for serving as a cryptic but efficient means of communication between the many part-time students who work on the



photo: D. Starr

Connie Rinaldo, graduate student working in the Information Systems Division, provides a text digitizing demonstration to a group of visitors to NAL.

project; and for chronicling the development of each database.

Each document—i.e., a book chapter, a leaflet, or some similar discrete item—is assigned a unique ID number by the computer at the time of scanning. This number is entered in the log, along with the number of images and the date. As each processing step is completed for that document, an additional date is entered in the log in an appropriate column.

The actual processing steps are as follows:

- 1) Page scanning
- 2) Image checking
- 3) Text conversion (done in batch jobs running overnight)
- 4) Text verification
- 5) Text editing
- 6) Archiving to WORM
- 7) Indexing

Some steps, such as text conversion, may have to be repeated for a given document. Indexing is usually done many times, as the database is tested and refined. And some extra steps have been added along the way, such as backing up the edited text files onto floppy disks—a practice the project staff highly recommends!

Text editing is a step the project managers did not expect to perform. But because of the variety of materials, and their variable quality, the text output was anywhere from 85% to 100% correct. A 15% error rate was just not acceptable, and WordPerfect was added to the system for text editing. After the project experimented with various levels of editing, all the way from correcting all mistakes to correcting none, it was learned that it is not only humans who have trouble with messy text. The build software, TextWare Plus, that was used to index the text for the first database was incapable of handling the various stray characters and multiple misspellings that were often output during the OCR process. The

project managers have since decided that if they provide full text conversion, it must be completely cleaned up. If the quality of the documents is too poor for text conversion—i.e., if they are yellowed or brittle, contain characters which are broken or else bleeding together, exhibit poor contrast between text and page color, have many characters outside the 6- to 28-point size range—OCR will not be done. Instead, the project will provide page images with only bibliographic records for access.

There was another unexpected development. The image format being used is a proprietary one which can be displayed only on an expensive, proprietary, high-resolution monitor. This image format is an excellent one, which is often better than the original when displayed on the high-resolution monitor or printed out on the laser printer. A one-megabyte image compresses to around 30 to 60 kilobytes for storage, and can be displayed in a few seconds. Project managers were chagrined and disappointed to learn that these images could not be displayed on a regular graphics computer monitor. The project staff waited over a year for software to convert the proprietary format to a standard TIFF (Tagged Image File Format) which a regular monitor could handle. When the project goes into production, the managers do not want to perform the extra step of image format conversion—not for thousands of images. Therefore, image format is a major issue as the project managers look to the future.

Results

Concrete results were delayed almost a year by staffing problems, software bugs, and system failures. The project staff had expected to finish the first CD-ROM in April 1988, but it wasn't actually ready until February 1989. Problems were so common that the motto became, "But it isn't any fun if there aren't any problems!" Staff members spoke longingly of finding a "Librarians' Rest Home." The longest delay was caused by manufacturer changes to the interface boards of the various components. When two of the original boards burned out, the replacements could not communicate with the others. SAIC had to re-integrate the entire system, and as a result, the system was down for several months. Interfacing, that is, getting disparate pieces of hardware to work together with the proper software, has been the single biggest impediment to the project.

But success did finally come, and it was—Oh, So Sweet! In January 1989, the project set about premastering the first CD-ROM, Aquaculture I, a collection of reference materials on aquaculture. Using a Meridian CD-Publisher purchased only shortly before, the staff arranged the files, simulated CD-ROM searching, and wrote the database to 9-track tapes. The tapes were sent to Digital Audio Disk Corporation, a CD-ROM mastering facility that, along with Meridian Data, had walked project staff through various

premastering steps. In February 1989 the CD-ROMs arrived. What a thrill it was to load one onto the computer and see it run!

The *Aquaculture* disc was sent to the cooperating land-grant libraries for evaluation in March 1989. These sites evaluated the contents of the disc as well as the retrieval software, TextWare Plus. A second disc, *Food, Agriculture and Science*, was produced by the Consultative Group on International Agricultural Research and runs on KAware2 software. This disc was evaluated by project sites, as well as by the international community. A 2-disc set on *Acid Rain*, also using KAware2, was the third to be distributed. This database was produced by the University of Vermont, and it contains Canadian acid rain publications. The fourth and final evaluation disc contains a collection of materials on *Agent Orange*. It was produced by NAL and runs under Windows Personal Librarian. The *Agent Orange* disc is still being evaluated by the land-grant sites.

Some Conclusions

Since replacing the original boards and re-integrating the system in January 1989, project staff have not experienced a single system failure. The project did have to replace the cache interface to the WORM drive, as it was not at all reliable. The project now uses a cacheless COREL interface, and it is serving well. Staff are still working on the issue of image format, and are following up on some promising leads.

The scanning workstation has been in almost continual operation since early 1989. Besides the two evaluation discs, and a third disc on *Food Irradiation* will soon be mastered. A fourth disc, containing the first 18 volumes of the *Journal of Agronomy*, is now in preparation. In between these discs, NATDP has scanned and OCR'd thousands of pages for other disc producers. Is it feasible to capture and preserve printed publications using this technology? For image scanning the answer is "YES." For OCR, the answer is "SOON;" but if the source materials are clean, high-quality originals, the answer is "YES."

The two workstations cost approximately \$150,000; of that, the Calera Recognition Server alone was \$35,000. Calera now sells its software with a board that fits inside a computer, for about \$3,500. Kurzweil, a leading competitor, sells similar products. So, costs are continuing to fall as the software, hardware, and interfacing all improve. The project managers are often asked if they wish they had waited a couple of years to begin, since they would obviously have saved a lot of money. The answer is always, "No." They have learned so much about this technology in the past three years. There just is no way to learn to produce a database on CD-ROM without doing it. And because of the early start, NAL has contributed in some small way to the development of the scanning and OCR industries. This surely

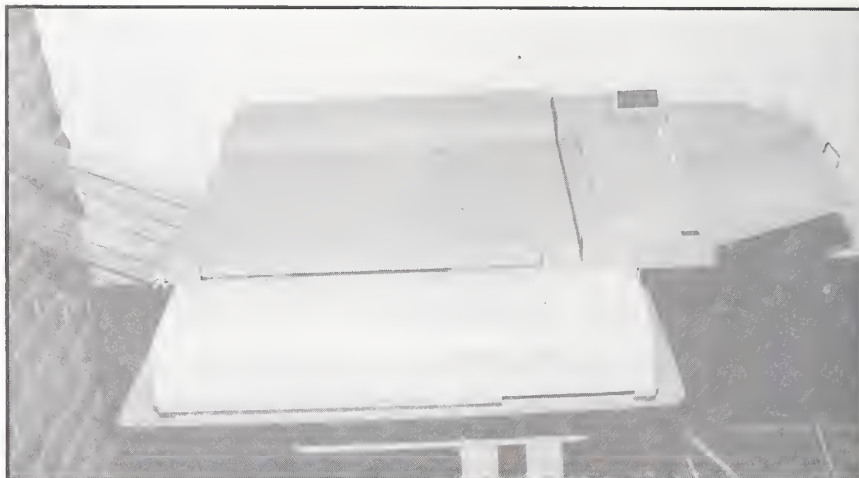


photo: D. Starr

Part of the NAL text-digitizing workstation. This is the scanner and related accessories. The scanner resembles the scanning part of an office copying machine.

benefits the agricultural community.

The evaluation questionnaires filled out at the land-grant libraries are at the heart of this study. Since they are still being analyzed by Iowa State University, NAL has not seen them. The Library can report, however, some of the comments heard from the study sites.

- Images are very helpful. Full page images are more helpful than just the graphics, which may be out of context and hard to understand. But full page images take more storage, so there are fewer on a disc.
- Full text is useful, especially when hits are highlighted. It is difficult to search and yields a lot of "noise." (Users may need to be educated about the differences between full text and bibliographic searching.)
- Databases should be larger (most of the discs contained 4,000 to 6,000 pages) and should concentrate on one topic.
- Retrieval software should be simpler and run in less memory. Or it should be able to make use of extended or expanded memory.
- All of agriculture should adopt the same retrieval package. (This is the request heard most frequently.)

A software evaluation team has been studying retrieval software for NATDP. Guided by the land-grant evaluations and experiences, the team will recommend a package to be used with NATDP CD-ROMs for the foreseeable future.

And what is the future? There will certainly be more CD-ROMs. NAL is preparing to explore scanning of microfilm, and a multimedia disc on *Ornamental Horticulture* is under way. The Library's mission is to collect, preserve, and disseminate agricultural information. The Library will use the latest technology whenever it helps accomplish this, and optical scanning coupled with CD-ROM is definitely helping.

Contacts for purchasing two of the CD-ROMs mentioned in this article:

Food, Agriculture and Science; Eleanor Frierson, CGIAR; World Bank, Rm. N5061; 1818 H Street, N.W.; Washington, D. C. 20433; Telephone: (202) 473-8942

Acid Rain; Attn: Albert Joy; 113 Bailey/Howe Library;

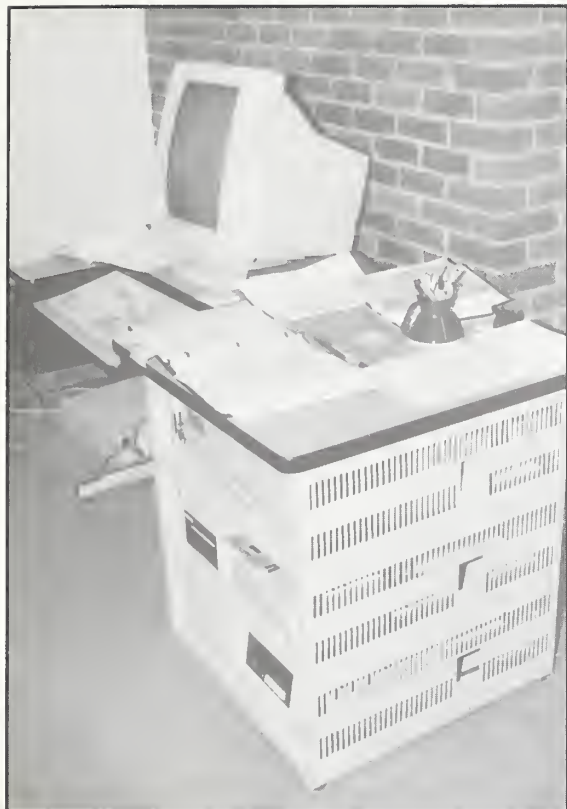


photo: D. Starr

Part of the NAL text-digitizing workstation. On the table are the monitor and keyboard, and below are stacked the computer on top, the WORM drive and a CD-ROM drive in the middle, and the converter on the bottom.

University of Vermont; Burlington, VT 05405; Telephone: (802) 656-8350

[A slightly different version of this article appeared in *CD-ROM EndUser*, 2(3):28-31, July 1990, published by Helgeson Associates, Inc., 1-800-688-3374.]



New Publications of Note

TOPICS Series Enhancements

Since the late 1970s, NAL has issued short bibliographies in an occasional series called AGRI-TOPICS, covering popular subjects in agriculture and especially horticulture. Besides reading lists, these AGRI-TOPICS often include information about organizations or other sources of further

information or supplies. Gardeners are interested in such titles as *Herbs*, *Dried Flowers*, *Bonsai*, *Organic Gardening*, *Cut Flowers: Production and Marketing*, and *Great American Gardening Books*. Other frequently requested ones are *Cheese and Yogurt Making at Home* and *Winemaking at Home*.

In 1989 the Aquaculture Information Center began producing a series called AQUA-TOPICS, offering such titles as *Seafood Safety and Standards*, *Fish Oil: Dietary Benefits of Omega-3 Fatty Acids*, and *Aquaculture for Youth and Youth Educators*.

The Food and Nutrition Information Center has now inaugurated a new series to succeed its widely distributed series called "Pathfinders." They will now be called NUTRI-TOPICS. These four-to-six-page publications provide information about resources on food or nutrition subjects for educators, health professionals/researchers and consumers, citing reading materials at the appropriate levels. The first two NUTRI-TOPICS are *Sports Nutrition* and *Nutrition, Learning, and Behavior*.

All NAL's series are now being issued International Standard Series Numbers (ISSN's) for ease of identification in libraries. The three TOPICS series, previously unnumbered, are now sequentially numbered as they are issued, and given ISSN's. Numbers have already been applied to AGRI-TOPICS and AQUA-TOPICS, soon to be followed by NUTRI-TOPICS. The first numbered AGRI-TOPICS title, published last month, was *Greenhouse Growing*, AT 90-01, by Carol Kopolow, Reference Section, NAL.

— Jayne MacLean



Agricultural Trade & Marketing

FAS Files Available on ALF

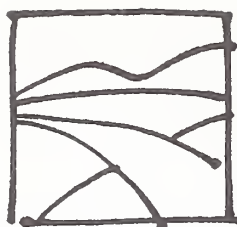
FILES from the High-Value Product Division of the Foreign Agricultural Service (FAS) Files are now accessible through ALF (Agricultural Library Forum), NAL's Electronic Bulletin Board.

The FAS files, prepared by U.S. agricultural attaches, contain annual marketing plans for forty countries. Karl Schneider, ALF Sysop, uploaded the marketing plans onto ALF.

For further information about using ALF and accessing the FAS files, please call (301) 344-1204, or write:

National Agricultural Library
ATTN: ALF, Room 111
10301 Baltimore Boulevard
Beltsville, Maryland 20705

— Mary Lassanyi



**Rural
Information
Center**

Information Delivery to Rural America Conference Held at NAL

**by Dorothy A. Heise
Rural Information Specialist
Rural Electrification Administration**

The Rural Information Center (RIC) and the Associates of the National Agricultural Library jointly sponsored a conference on "Information Delivery to Rural America" on April 24-26, 1990. At the national meeting, 31 RIC State Coordinators or their designated representatives spent three days discussing their coordinating role with RIC and responsibilities in delivering information to the rural public. H. Bland Franklin, Virginia Cooperative Extension Service, Chair of the Planning Committee, and RIC State Coordinators from Missouri, James Preston, Nebraska, Janet Meisenbach, Texas, Douglas Steele, and Utah, David Rogers, outlined the objectives of the conference:

- To revitalize enthusiasm of RIC State Coordinators for sharing RIC potential to help local officials and volunteer leaders improve the economic well-being of rural communities.
- To inform workshop participants about rural development legislation and programs as well as RIC programs, expansion, and future plans.
- To acquire ideas that can be used in the RIC state program.
- To provide feedback to the RIC national staff to assist in reporting, interpreting, and evaluating the RIC program.

Joseph Howard, Director of the National Agricultural Library, opened the meeting by noting that the merging of NAL and Extension staffs was ideal. Librarians know where information is stored and Extension has special subject expertise for interpreting information for the requester.

Myron Johnsrud, Administrator of the Extension Service, described RIC's brief evolution which began as a small effort and grew to become a recognized part of President Bush's Rural Development strategy. RIC gained support from "Congressional appropriations as well as other USDA agencies and federal cabinet level departments with rural programs," Johnsrud stated.

"The information center concept represents a philosophical change in how we make education available to our clients," Johnsrud said. Confirming his total commitment to the RIC program, Johnsrud challenged the

participants to work with their institutions and other agencies to increase the public's access to the knowledge available in the nation's public institutions.

Patricia John, RIC Coordinator, reviewed RIC's three development phases: the six-month pilot test; the state-level development phase; and the national-level expansion program supported in President Bush's 1990 rural economic development initiative. Ms. John concentrated her discussion on RIC's activities during the FY90 national expansion program.

- RIC's state-level activities included establishing a network with State Libraries to assist RIC in locating information and documents for the Cooperative Extension Service at the local level; establishing a library science intern program with Clarion University of Pennsylvania; and training all the RIC State Extension coordinators who in turn promoted RIC in their respective states.
- RIC accelerated its national promotion program in FY90 and is now a focal point for federal agency cooperation—an effort encouraged in President Bush's recent rural economic development initiative.
- RIC agreed to establish and operate the Rural Information Center Health Service (RICHS) for the Office of Rural Health Policy, U.S. Department of Health and Human Services, (DHHS), as a part of the RIC operation.
- RIC has plans for future cooperative efforts with the Small Business Administration, the Rural Electrification Administration, and the Forest Service.
- RIC also plans to implement an "800" toll-free number.

Working sessions were held during the first and second days of the conference. In the first session, groups discussed the top items that needed to be addressed by RIC in the near future. Improved document delivery was an issue which was of concern to many RIC coordinators, as was networking efforts to provide more efficient services to rural users. Participants pointed out that one barrier to interpreting information for users was the lack of training in rural economic development on the part of CES staff. Clarification was needed in the role that Extension and RIC national staff have in rural development.



photo: J. Swab

Panel at the table includes (L-R) Blaine Stockton, Rural Electrification Administration; Ruth McWilliams, Forest Service; Jeffrey Human, Department of Health and Human Services; and John Cox, Small Business Administration.

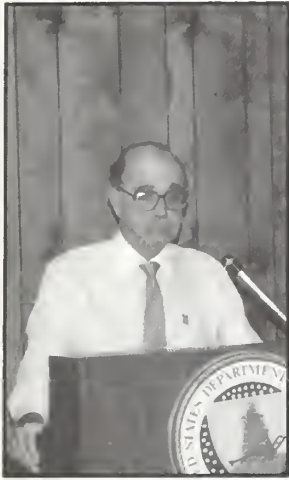


photo: J. Swab

Roland Vautour, Under Secretary for Small Community and Rural Development, speaks at the conference on "Information Delivery to Rural America."

A dialogue on the state efforts to promote RIC was the focus of the second working session. Panelists were asked to relate the commitment of their institutions to the RIC program, the resources available to them for RIC activities, the organization of their RIC program, the methods they use, and examples of the successes or outcomes of the program. The six presenters were Ron Anderson, North Dakota; Bob Czerniak, New Mexico; Larry Dunn, Colorado; Bill Eberle, Kansas; Jeri Marxman, Illinois; and Doug Steele, Texas. All of the panelists stated that their states had a strong commitment to RIC, though resources for the program varied among the states.

Staff time devoted to RIC activities amounted to between two and four hours per week depending on their additional duties and other available office assistance. The biggest success story presented was one of a frontier hospital in DeBaca County, New Mexico, that received grants totaling \$475,000 which were used to upgrade antiquated equipment. RIC provided the information which identified a federal grant program and resource information for them to apply for a state grant.

During the third working session, participants attended concurrent sessions designed to provide feedback to the RIC national staff to assist in reporting, interpreting, and evaluating the RIC program.

David Freshwater, senior economist with the Joint Economic Committee of Congress, spoke about the new rural development legislative proposals; the Rural Partner-

ship Act proposed by the Senate and the Rural Economic Development Act of 1989 by the House. Freshwater asked "how did rural development legislation come so close to passage over the last year, after the failure to move legislation in the past?" He answered by saying that the "Administration, in a major change of its previous attitude, expressed an interest in rural development." Freshwater said that a "great deal of the funding for rural development is coming out of already existing program funds, but the Department will put the money to better use." Freshwater also said that he "does not expect to see the passage of rural development legislation in 1990."

Roland Vautour, U. S. Department of Agriculture, (USDA), Under Secretary for Small Community and Rural Development, opened the final day of the conference. He expressed the Department's enthusiasm for the success of the RIC programs. He described RIC's expansion plans and gave as one example the integration of the National Rural Health Information Clearinghouse into RIC. "An inter-agency agreement between USDA and the Department of Health and Human Services (DHHS) has been finalized which would transfer funding and management of the clearinghouse to RIC," the Under Secretary stated.

The federal government's role in rural development includes a Rural Revitalization Task Force headed by Vautour, which "has explored ways to make existing resources work better for rural America." In 1989, the President's Economic Policy Council formed the Working Group on Rural Development, chaired by the Honorable Clayton Yeutter. This "cabinet-level working group is a permanent policy-making group. The President's Council on Rural America will report directly to President Bush on rural matters," Vautour explained. The Council will "focus on rural development at the national level, advise on policy and apply innovative thinking to improve the development potential of rural America. State-level rural development councils will be created to improve information delivery to rural America, and to act as fact-finding groups." Other initiatives mentioned by Vautour were demonstration projects, model programs and enterprise zones to start businesses in rural areas. The Presidential initiatives outlined by Vautour call for the "extension of the Rural Information Center, with all relevant federal



photo: J. Swab

Jeffrey Human, Director, Office of Rural Health Policy, DHHS, discusses expectations for the RICHS, Rural Information Center Health Service.



photo: J. Swab

Persons attending the conference on "Information Delivery to Rural America" were the RIC State coordinators or their representatives from throughout the U.S.



USDA photo
Doug Steele, Texas RIC Coordinator, received one of the first two awards given in the RIC program, the other to Bob Czerniak, New Mexico RIC Coordinator.

agencies participating." Vautour concluded, "The key to the success of a rural development program is leadership."

The remaining speakers on the final day of the conference spoke about the federal government's commitment to RIC. Jeffrey Human, Director of the Office of Rural Health Policy, DHHS, discussed his expectations for the Rural Information Center Health Service project being funded by DHHS and operated by RIC beginning in FY91. The RICHs program will provide rural

health information to assist rural hospitals and health services. John Cox, Associate Administrator for Business Development, U. S. Small Business Administration, announced a National Action Plan and that SCORE (Service Corps of Retired Executives Association) would provide assistance in answering business development questions in RIC.

Blaine Stockton, Assistant Administrator for Management, Rural Electrification Administration, USDA, explained that REA is making loans to its electric and telephone borrowers to promote economic development and creation of jobs in rural areas. He encouraged all RIC coordinators to participate in the programs by making the program known to rural borrowers. "The program is not limited to electrical or telephone projects," Mr. Stockton said.

Ruth McWilliams, USDA, Forest Service (FS), explained that the Forest Service has a "broad range of resources available to assist in planning and implementing rural development activities. Participation in RIC is part of the FS strategic plan and several options are being explored. The Forest Service plans to link its cataloging service at NAL to the RIC program, develop a liaison position, and fund a staff person to work with the RIC program," McWilliams said.

Jim Preston, Missouri RIC State Coordinator, provided closing remarks about the value of the conference program and the sharing of information and state program ideas.

Concluding the conference, Pat John and Bob Lovan, Extension Service National Program Leader for Rural Revitalization, presented awards to New Mexico RIC Coordinator Bob Czerniak and Texas RIC Coordinator Doug Steele. These first awards given in the RIC program were for "innovative state programs, commitment, and high use of RIC."

Rural Information Center's Online Monitoring System

by Louise Reynnells and Patricia John
Rural Information Center, NAL

The Rural Information Center (RIC) at the National Agricultural Library uses a Local Area Network (LAN) with customized off-the-shelf software to monitor all of its incoming information requests. RIC intended the system, officially dubbed the RIC Online Monitoring System, shortened to "ROMS," to collect statistics on the number of RIC requests received, the user's affiliation (i.e. local official, extension agent, librarian, etc.), the geographic location of origin of the telephone or mail request, and the general subject matter of the request (i.e. economic, local government services, health, etc.). The data is tabulated in a specially designed library management report. The ROMS statistical data also provides the Extension Service with the capability to monitor specific rural trends by geographic areas. The RIC staff can also search ROMS by keywords allowing them to locate identical requests so that they are able to provide the same information without duplicating both online and manual search efforts.

ROMS generates unique "case numbers" for all RIC requests which allow searching the database by the case number, last name, and zip code and running reports by different categories, such as: date received, the staff person who entered and/or closed the case, geographic location (country, state, region), subject area, type of request (reference or ready reference), and length of time to complete the request. The reports also indicate whether RIC staff used online or CD-ROM systems to handle questions and whether RIC referred the request to another organization, agency, or expert.

Another specific management report lists all RIC reference cases with a brief description of each specific request. ROMS sorts the reference cases by state, user affiliation, and date range. An example of a report combination would be one for all requests for one particular month from local officials that contacted RIC from the state of Arizona. This allows RIC and the Extension Service to identify trends in states and regions of the U.S. on rural issues.

ROMS also has various databases within the system. One is a database for frequent callers such as the RIC State Extension Coordinators; another lists all RIC publications. These databases make it easy to input information into the system. The ROMS pop-up screen can identify callers as frequent RIC users, such as a State Coordinator, so that the RIC staff can automatically transfer the coordinator's name, address, and telephone information to the current request case, saving input time and eliminating the possibility of keying address errors. The "Pub List" database collects statistics on all RIC publications sent and can give totals for any given time period: day, week, month, year, etc.

RIC staff search the database by entering keywords in a designated text field which can then pull together a listing of

all requests with that same keyword or keywords. ROMS also allows the staff to limit searches to date, a range of case numbers, and state. The searchers can use keywords singularly, as a single string, or in combination. If the RIC searchers locate previous cases on the same subject as the current request, they examine the previous case file and duplicate materials for the subsequent request; this cost saving feature eliminates performing duplicate searches of online and manual information.

ROMS also functions as a managerial tool. RIC management can query ROMS to identify unfinished or "open" cases so they are not "lost in the shuffle." ROMS also tracks the length of time required for the staff to handle each request. Other features include word processing through WordPerfect and a letter writing component.

ROMS has proven itself to be an asset in this information center and well worth the time it took to set up the LAN, customize the screens and the special management report, and enter the data.

For more information on "ROMS" contact:

*Rural Information Center, Room 304
National Agricultural Library
10301 Baltimore Boulevard
Beltsville, Maryland 20705*

Or call 1-800-633-7701. Washington D. C. area and international callers use 301-344-2547.



photo: J. Swab

Louise Reynnells and Patricia John introduce the ROMS system to the National Agricultural Library Staff.



News Notes

Indexing of Core Veterinary Journals

by Shirley Edwards
Head, Indexing Branch, NAL

A recent article written by R. J. Veenstra and J. C. Wright, "Coverage of sixty core veterinary medical journals by ten indexing and abstracting tools" (*Journal of the American Veterinary Medical Association*, vol. 196 (12), June 15, 1990, p. 1931-1936) reported that the *Bibliography of Agriculture* only covered 18 of the 60 core veterinary medical journals included in the study. NAL's Indexing Branch actually covers 43 of these journals for AGRICOLA which are subsequently published in the *Bibliography of Agriculture*. The 43 veterinary journals indexed by NAL are:

*Advances in Veterinary Science and Comparative Medicine
American Journal of Veterinary Research
Animal Production
Australian Veterinary Journal
Avian Diseases*

*Avian Pathology
Bovine Practitioner
British Veterinary Journal
Canadian Journal of Veterinary Research
Canadian Veterinary Journal
Companion Animal Practice
Comparative Immunology Microbiology and Infectious Diseases
Compendium on Continuing Education for the Practicing Veterinarian
Cornell Veterinarian
Equine Practice
Equine Veterinary Journal
In Practice
Journal of Animal Science
Journal of Comparative Pathology
Journal of Dairy Science
Journal of Reproduction and Fertility
Journal of Small Animal Practice
Journal of the American Animal Hospital Association
Journal of the American Veterinary Medical Association
Journal of the South African Veterinary Association
Journal of Veterinary Internal Medicine
Journal of Veterinary Pharmacology and Therapeutics
Journal of Wildlife Diseases
Laboratory Animal Science
Laboratory Animals
Poultry Science
Research in Veterinary Science
Theriogenology
Tropical Animal Health and Production
Veterinary and Human Toxicology
Veterinary Clinics of North America: Equine Practice
Veterinary Clinics of North America: Food Animal Practice
Veterinary Clinics of North America: Small Animal Practice
Veterinary Medicine
Veterinary Pathology*

Until recently, eight additional veterinary medical journals were covered in AGRICOLA and the *Bibliography of Agriculture*. Coverage of these eight journals was ceased to avoid duplicate indexing by National Agricultural Library staff and other participants in the cooperative international database, AGRIS, produced by the Food and Agriculture Organization of the United Nations.

The authors of the JAVMA article determined the coverage of 60 core veterinary medical journals by examining lists of journal coverage of 10 indexing/abstracting tools. The list of journals printed in the *Bibliography of Agriculture* is merely a listing of those journals cited in that particular issue; **it is not a complete list of journals covered.** The *Bibliography of Agriculture* is published privately by The Oryx Press and is derived from NAL's bibliographic database, AGRICOLA.

A complete list of journals covered in AGRICOLA and the *Bibliography of Agriculture* has been published by NAL. The *List of Journals Indexed in AGRICOLA* is updated annually. The main section is alphabetically arranged by full title and each entry includes, in addition to the full title, an abbreviated title, publisher, place of publication, International Standard Serial Number (ISSN), NAL call number, coverage information (whether the journal is indexed cover-to-cover or selectively), and indicates which journals have their author abstracts included in the AGRICOLA citation. There is also a section arranged alphabetically by abbreviated journal title, a listing of journals by subject, a list of new titles added, and a list of titles no longer indexed. The *List of Journals Indexed in AGRICOLA* can be obtained free of charge by sending a request with a self-addressed mailing label to:

Indexing Branch
National Agricultural Library
10301 Baltimore Boulevard
Beltsville, Maryland 20705

Indexing Seminar at NAL

by Susan Lohmeyer
Vice Chair, D.C. Chapter
American Society of Indexers

Forty-five indexers of all varieties met April 20th at the National Agricultural Library in Beltsville, Maryland, for a day-long seminar on new technologies in indexing sponsored by NAL and the American Society of Indexers (ASI). Although the seminar was designed primarily for database indexers, the handful of back-of-the-book indexers present also found it fascinating.

Susanne Humphrey of the National Library of Medicine (NLM) spoke on knowledge-based indexing, with special reference to a unique prototype, the MedIndEx system. Such an expert system can potentially use existing thesauri and classifications as well as artificial intelligence computer languages. MedIndEx is currently being developed for use with the MeSH thesaurus (Medical Subject Headings) to index the MEDLINE database in MEDLARS at NLM.

Judy Zidar of the National Agricultural Library discussed optical scanning, a process by which printed materials are transferred to an electronic format. Their scanning has gone well; it is "fast, good, and easy," with a text conversion accuracy rate of 1 to 15%. However, their experiences have highlighted the importance of indexing, because full-text retrieval is expensive to provide, difficult for novices to use, and often lacks the discrete access necessary to make it really useful. She suggests that hypertext linked with full-text retrieval is the wave of the future.

Ronald Buchan, a lexicographer at the NASA Scientific & Technical Information Facility operated by RMS Associates, explained their use of retrospective indexing. When new NASA thesaurus terms are developed, computer-aided indexing is used to search all titles and abstracts already in the database; both major and minor terms are added to the record. Currently they deal with 3 million volumes with postings of 18 million.

Cliff Urr of Planning Analysis Corporation spoke on the uses and significance of hypertext. He explained hypertext as electronic information access that does not require user sophistication; it is a nonlinear way of accessing information that has active cross-references with screen access and linkages of information. He quoted James Burke, historian of science, as saying that hypertext is to the computer what the printing press was to paper and ink. However, poor hypertext applications are appearing already; he feels that indexers are uniquely qualified to produce superior hypertext documents and that it is important that they become involved in this field.



photo: J. Swab

Susan Lohmeyer, Vice Chair, D.C. Chapter, American Society of Indexers (left), prepares the overhead projector for a presentation at the final session of the seminar on new indexing technologies held at the National Agricultural Library.



photos: J. Swab

(Above) Speakers at the seminar on new technologies in indexing were (L-R) Ronald Buchan, RMS Associates; Susanne Humphrey, National Library of Medicine; Clifford Urr, Planning Analysis Corporation; Judi Zidar, National Agricultural Library; and Susan Lohmeyer, Vice Chair, D.C. Chapter, American Society of Indexers.

(Below) Between sessions Clifford Urr (center) converses with Sarah Thomas, Associate Director for Technical Services, NAL (right), while Shirley Edwards, Head, Indexing Branch, NAL (facing camera on left), talks with another seminar participant. NAL's Indexing Branch and the American Society of Indexers co-sponsored the seminar.



INFORMATION MANAGEMENT IN THE DEVELOPING WORLD

Planning is underway for the **Third National Conference on Librarians in International Development** to be held at Oregon State University in Corvallis, April 28-30, 1991. Individuals are invited to submit abstracts of papers, posters, or panels addressing the theme, "information management in the developing world." All phases of information management will be considered, including: training for staff, new technologies, acquisitions, preservation, bibliographic control, reference services, resource sharing, and the role of library activities in project management. Presentations should represent work done in developing countries or organizational ties which have fostered improved information management.

Submit abstracts to program co-chair: Rita Fisher, Owen Science And Engineering Library, Washington State University, Pullman, WA 99164-3200.

Address other inquiries to program co-chair: Shirley Scott, Kerr Library, Oregon State University, Corvallis, OR 97331-4501. Telephone: (503) 737-3260.

NOTE: Although the deadline for submission of abstracts was November 1, 1990, readers who have relevant presentations and missed announcements elsewhere are urged to submit abstracts as soon as possible to either co-chair.



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Staff Update

Neis Retires



photo: J. Swab

Tom Neis

At the end of September Thomas Neis retired after serving for nearly eight years as Executive Officer at the National Agricultural Library.

Of these years he said, "Helping Joe Howard rebuild NAL represents a perfect ending to my government career. I only hope in these uncertain times, that NAL will be able to continue providing a beacon to the agriculture library community."

Mr. Neis began his government career in the U.S. Air Force in

1949. After leaving the Air Force in 1952, he majored in Business Administration at St. Cloud State University, Minnesota, and earned his B.A. in 1956. Upon graduation he began service with the Department of Agriculture, where he remained till retirement. From 1956-64 he was Personnel Officer and then Administrative Officer in the Agricultural Marketing Service. He moved to the Agricultural Research Service where he served in a variety of positions from 1964-78, including Program Analyst, Financial Branch Head, and Executive Officer. From 1978-82, he was Executive Officer of the Nutrition Research Center, and joined the NAL staff at the beginning of 1983. While working at these positions he completed graduate level studies at several universities in the Washington, DC, area. During his career he received numerous awards for special acts and performance.

Looking back on his time in government service, Mr. Neis said, "It has been a very satisfying career. Generally, in every job I've had the opportunity to work to the limit of my ability. Also, I've been fortunate enough to see the results of some of my work be used to the benefit of the agencies. My bosses in all cases were outstanding leaders and great human beings. Probably most important, I've had very loyal and competent staff, including people who have become lifetime friends."

Mr. Neis is married and has four children (all married) and four grandchildren. In retirement he has lots of plans,

including completing a house-building project and perhaps beginning another, pursuing outdoor activities including hunting and fishing, traveling and spending time with his grandchildren, performing charity work, and "not getting up at 5:00 a.m."

—Joseph N. Swab

Hayes Returns from Joint Council



photo: J. Swab

Kate Hayes

In July Kate Hayes returned full-time to NAL after a year full-time and several months part-time with USDA's Joint Council on Food and Agricultural Sciences. The Joint Council was established by Congress in 1977 to encourage and coordinate research, extension, and higher education activities in the food and agricultural sciences in the United States. Additional legislation in 1981 and 1985 strengthened the Council's responsibilities to improve the planning

and coordinating of both public and private sector activities in these areas, and in relating the Federal budgeting process to the overall functioning of the system. Council membership consists of representatives of about 15 land-grant and other universities, the heads of about 10 USDA agencies, several representatives from foundations, producers, industry, international programs, and research boards, committees, and other councils. Currently the Joint Council is co-chaired by Dr. Charles E. Hess, Assistant Secretary, Science and Education, USDA, and Dr. H. Rouse Caffey, Chancellor, Louisiana State University Agricultural Center. At the Joint Council, Ms. Hayes was Leader of the Reports Staff.

At NAL Ms. Hayes is Coordinator of the recently formed Technology Transfer Information Center. She brings to this new assignment much previous experience in launching a new center, for before going to the Joint Council, she had started and coordinated the Family Information Center and the Fiber and Textile Information Center. She had also taken the lead during the formative stages of the Rural Information Center, the Youth Development Information Center, and the Water Quality Initiative before turning them over to other staff, had worked with others in developing the home economics portion of the Library's collection when these subjects were added to NAL's scope, and had begun work on the Technology Transfer initiative.

As coordinator of the new center, Ms. Hayes is working first on determining the role of the center in gathering and disseminating information on technology transfer. She is identifying technology transfer programs in USDA agencies, finding out who is doing what research, determining what information needs to be disseminated to others and in what form, determining what information needs to be gathered, cataloged and indexed, and added to the NAL collections, and perhaps—as the center develops—coordinating dissemination of information on what new technologies are needed by the public so that resources can be directed to researchers and other innovators to develop them.

As with any new information center (and some of the established ones) there are problems getting funding, staffing, space, and other resources. At present the Technology Transfer Information Center shares a librarian and a journalism student with Water Quality/Biotechnology, a library school student with Youth Development, and clerical staff with the Reference and User Services Branch.

The center is working closely with the Technology Transfer Society, having begun to index its *Journal* in AGRICOLA. Ms. Hayes has also become editor of the Society's newsletter, *T² Squared: A Current Awareness Summary of Technology Transfer and Related Activities*. Her first issue of the monthly newsletter was V. 15, No. 7, October 1990.

At the Joint Council, Ms. Hayes worked closely with the council members and staff to produce three Congressionally mandated reports: *Fiscal Year 1992 Priorities for Research, Extension, and Higher Education: A Report to the Secretary of Agriculture*, June 1990; *Fiscal Year 1991 Priorities...*, June 1989; and *1989 Accomplishments...*, November 1989. Ms. Hayes coordinated the input to these reports from scientists, administrators, program officers, and others from across the country, writing summaries, rewriting and editing report segments, and working with design, photography, and printing staffs. She also made improvements in the distribution system which gets the final reports to Congress, USDA administrators, the press, universities, and the public.

In developing the reports, she developed new sets of instructions to the three national committees and two regional councils that submit materials to the Joint Council for inclusion in the priorities and accomplishment reports. As editor, she determined how the material accepted by the Joint Council would be presented in the reports and how the reports would be prepared for publication. In discussing her work at the Joint Council, Ms. Hayes said, "It was a wonderful year professionally and personally, a tremendous experience."

—Joseph N. Swab



New Bibliographies

The bibliographies in the *Quick Bibliography* series are primarily computerized online as batch bibliographies emanating from searches performed by the NAL Public Services Division Staff in response to customer requests. Searches are selected for inclusion based on the currency of the topic, interest among clientele, and probable value to a larger audience. Since October 1988, all *QB's* include search strategies. Unless otherwise specified, citations are from AGRICOLA.

The other bibliographic series, including *Special Reference Briefs*, have been researched and produced to meet special needs of clientele of the Library and its Information Centers. Revisions or updates will be announced when produced. Only one copy of a requested title will be sent; however, requesters may make copies. To request a copy of a *Quick Bibliography*, *Special Reference Brief*, or other bibliographic work, circle the desired title(s) below and send your request with a self-addressed label to:

Reference Branch, Room 111
National Agricultural Library
Beltsville, MD 20705

Quick Bibliographies

Q.B.—90-89. Shellfish Diseases and Control, January 1985-June 1990. 127 citations; languages: none excluded. Prepared by Eileen M. McVey. September 1990.

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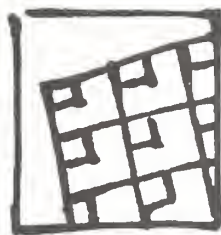
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SH380.6.W67



Agriculture Datebook

November 13-16: VIVEUROPE 90 Internat'l Trade Fair on Intensive Animal Production and Processing. Utrecht, The Netherlands. Contact: Larry Singleton, Expo Group, (404) 631-3976.

November 19-21: Global Change Conference. Washington, DC. Contact: (202) 786-3300.

November 26-29: 74th Annual Meeting of the National Milk Producers Federation. San Diego, CA; Marriott Hotel & Marina. Contact: (202) 653-6976.

November 27: Soil Conservation Service Workforce Diversity Conference. Sparks, NV. Contact: (202) 447-3291.

November 27-29: Forest Service Workforce Diversity Conference. Atlanta, GA. Contact: (202) 382-9110.

November 27-29: National Fertilizer Solutions Association 36th Annual Convention. St. Louis, MO; Cervantes Convention Center. Contact: NFSA, (309) 691-2870.

November 29: National American Wholesale Grocers' Seminar. Washington, DC. Contact: (703) 532-9400.

December 2-4: American Meat Institute Worker Safety Conference. Memphis, TN; The Peabody Hotel. Contact: James Marsden, AMI, (703) 841-2400.

December 3-4: National Grain & Feed Association Annual Country Elevator Council Meeting. Kansas City, MO; Westin Crown Center Hotel. Cont: NGFA, (202) 783-2024.

December 3-4: NIH Regional Workshop on Implementation of Public Health Service Policy on Humane Care and Use of Laboratory Animals. Kingston, RI, University of Rhode Island. Contact: URI Conference Center, (401) 792-2170 or (401) 792-2833.

December 3-6: General Agreement on Tariffs & Trade/Conclusion of Uruguay Round. Brussels, Belgium. Contact: (202) 447-7907.

December 4-5: Farming for the Future Training Seminar. Atlantic City, NJ; TropWorld Hotel. Contact: Jean Hornyak, (609) 989-6832.

December 5: Biotechnology Symposium for Control & Product Quality in Meat Production. Washington, DC. Contact: (202) 447-5923.

December 5: Food and Nutrition Service Workshop. Quincy, IL. Contact: (202) 382-9681.

December 5-7: National Association of Government Communicators Annual Conference. Arlington, VA; Rosslyn West Park Hotel. Contact: NAGC, (703) 823-4821.

December 6: Workshop on Innovations in Cooperative Finance. Sacramento, CA. Contact: (202) 653-6976.

December 6-7: American Society of Animal Science Symposium. Washington, DC. Theme: "Biotechnology for Growth and Product Quality in Meat Production: Implications and Acceptability." Contact: (202) 447-8885.

December 6-7: Food Processors Institute Workshop. Washington, DC; Ramada Renaissance Hotel. Contact: Drusilla Cunningham, FPI, (202) 393-0890.

December 8: 24th National Young Farmers Educational Institute. Denver, CO. Contact: Don Korrey, NYFEI, (303) 522-8104.

December 9-10: American Farm Bureau Federation Board Meeting. Chicago, IL. Cont: AFBF, (202) 484-3600.

December 10: Low Input Sustainable Agriculture (LISA) Meeting. Washington, DC. Contact: (202) 447-5923.

December 11: IPPS Eastern Region 40th Anniversary. Cleveland, OH. Contact: (202) 447-5923.

December 11: North Central Weed Science Society. Des Moines, IA. Contact: (202) 447-8885.

December 12-13: International Symposium on Modeling Agricultural, Forest and Rangeland Hydrology. Chicago, IL; Hyatt Regency. Contact: American Society of Agricultural Engineers, (616) 429-0300.

December 12-16: Fish Farming Expo IV. New Orleans, LA; Rivergate Exhibition Center. Contact: Expo, P.O. Box 25402, Little Rock, AR 72221-5402.

December 17-18: Sixth International Symposium on Agricultural and Food Processing Wastes. Chicago, IL; Hyatt Regency. Contact: (616) 429-0300.

1991

January 6-9: Harvard Business School Agribusiness Seminar. Boston, MA. Contact: HBS, Soldiers Field, Boston, MA 02163.

January 6-10: American Farm Bureau Federation 72nd Annual Meeting. Phoenix, AZ. Cont: AFBF, (202) 484-3600.

January 7-10: 34th Tobacco Workers' Conference. Topic: "Uruguay Round Impact on Tobacco Policy." Charleston, SC. Contact: (202) 447-4164.

January 10: Eleventh Agricultural Symposium. Washington, DC; World Bank. Contact: (202) 447-4164.

January 12-17: American Library Association. Mid-winter Meeting. Chicago, IL.

January 13-17: National Turkey Federation 53rd Annual Convention. Orlando, FL; Walt Disney World Swan Hotel. Contact: NTF, (804) 435-7206.

January 16-18: Pacific Coast and National Bargaining Conference. Seattle, WA. Contact: (202) 653-6976.

January 17-20: American Sheep Industry Association Annual Convention. Long Beach, CA; Convention & Visitors Center. Contact: ASI, (303) 771-3500.

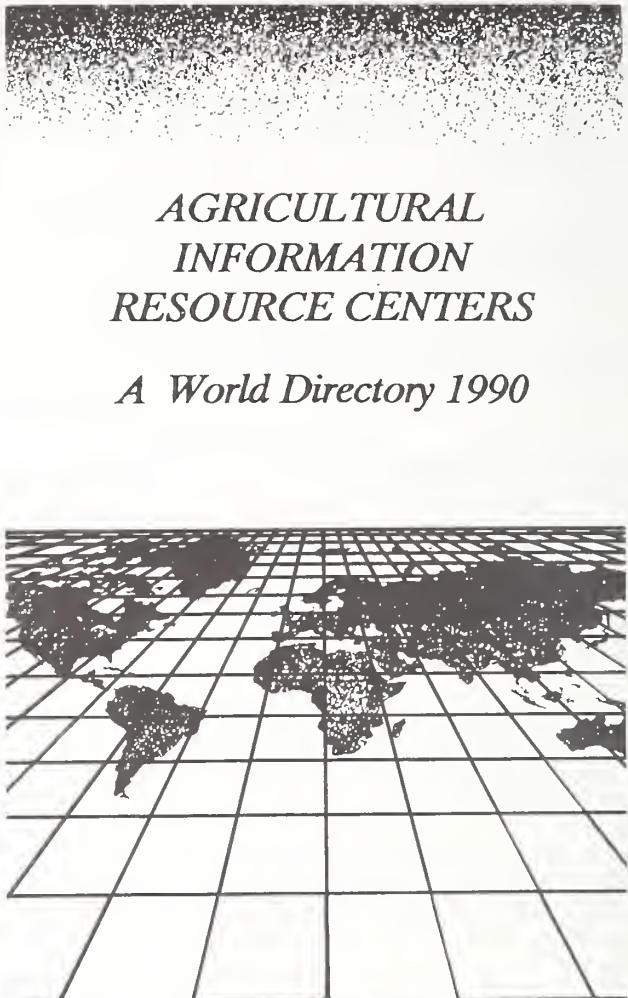
January 20-22: National Cattlemen's Association Convention & Trade Show. Dallas, TX; Dallas Convention Center. Contact: NCA, (202) 347-0228.

January 20-25: Annual Meeting of the National Council of Farmer Cooperatives. Nashville, TN. Contact: (202) 653-6976.

January 23-26: Food Pack of the Americas Expo and Conference. Miami Beach, FL; Miami Beach Convention Center. Contact: FPA, #900, 200 N. Glebe Road, Arlington, VA 22203.

January 30-February 1: Southeastern Poultry & Egg Association International Poultry Trade Show. Atlanta, GA; Georgia World Congress Center. Contact: SPEA, 1456 Church Street, Decatur, GA 30030.



February 2: United Fresh Fruit and Vegetable Association and Produce Business 1st Annual Retail Institute. Anaheim, CA. Contact: (703) 836-3410.



AGRICULTURAL INFORMATION RESOURCE CENTERS

A World Directory 1990

Rita C. Fisher
Julia C. Peterson
John W. Beecher
Jane S. Johnson
Carol Boast

 IAALD  CTA

Urbana, Illinois
United States of America
1990

February 2-6: Southern Association of Agricultural Scientists 88th Annual Meeting. Fort Worth, TX. Contact: Vernon Boggs, SAAS, (703) 231-6295.

February 5: Southern Association of Agricultural Scientists. Fort Worth, TX. Contact: (202) 447-5923.

February 14-19: American Association for the Advancement of Science. Washington, DC.





AGRICULTURAL INFORMATION RESOURCE CENTERS A WORLD DIRECTORY 1990

The International Association of Agricultural Librarians and Documentalists (IAALD), in cooperation with the Technical Centre for Agricultural and Rural Cooperation (CTA), is pleased to offer an updated and enlarged directory of agricultural libraries and documentation centers.

The 8.5 x 11 inch hardbound Directory covers agriculture in a broad context, including fisheries, range management, forestry and veterinary medicine. However, food and human nutrition are not included. The Directory contains addresses and phone numbers for over 4,000 libraries and documentation centers throughout the world. Entries include, as provided: telex and telefacsimile numbers, subjects and sizes of collections, types and languages of materials

collected, services provided, inhouse databases maintained and commercial databases searched.

The primary language of the Directory is English. The names of the institutions are also given in the language of the country, when provided.

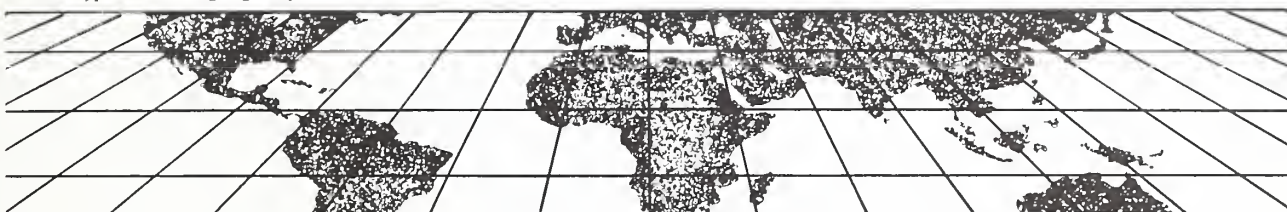
The Directory is arranged by country and then by cities. Indices at the end of the main text provide the user with several access points: institution by name, parent institution, former name(s) and subject(s) of collections and/or services. Each index is subdivided by country.

The Directory, the culmination of a 5-year volunteer effort, should prove to be an extremely valuable reference tool. Every attempt has been made to insure

that the information is both complete and accurate. Each copy includes an update form. The editors encourage all suggestions, whether for new materials or corrections to existing entries.

IAALD plans to use income from the Directory to sponsor continuing education for librarians and documentalists from developing nations. More information on these programs will be forthcoming in the IAALD Bulletin.

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(ISSN 0095-2699)

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Joseph N. Swab, Editor.

Idalia Acosta, New Serials Editor.

Ruth Finnblade, Publications Exchange Editor.

Daniel Starr, Photographer.

[(301)-344-3937]



(Left above) NAL Director Joseph H. Howard presents an outstanding performance award to Executive Officer Thomas Neis a few days before his retirement.

(Left) The staff who worked most closely with Tom Neis as Executive Officer were present at the awards ceremony held in the Director's Office. (L-R) Celine Gilheany, Budget Analyst; Nancy Chase, Accounting Technician; Tom Neis; Paul Bennett, Budget Officer; Maria Archer, Secretary; Diana Lemon, Administrative Support Assistant; and Louise Bruce, Facilities Manager.

For a retirement story on Mr. Neis see page 18 of this issue of *ALIN*.